



Notice of Allowability

Application No.

09/619,520

Examiner

Leigh McKane

Applicant(s)

HOLLANDER, BRAD C.

Art Unit

1744

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to RCE of 9/6/05 and Amendment of 11/16/05.
2. ☒ The allowed claim(s) is/are 42-66.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

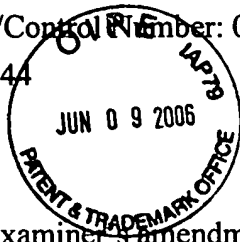
Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|--|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |

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EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mr. Brad Hollander on 19 January 2006.

The application has been amended as follows:

Cancel claims 1, 3-8, 13, 16-20, 22, 24-28, 33, 36-40 and replace with the following new claims.

42. (New) An apparatus for pumping and sterilizing or disinfecting liquid held in a reservoir, comprising:

a fluid conduit, which is at least partially submerged in the liquid held in the reservoir;

an ultraviolet lamp which is at least partially within the fluid conduit, the ultraviolet lamp comprising:

a tube holding and in direct contact with a gas and a vaporizable metal, the tube comprising a body portion, at least one end portion, and optionally at least one end cap covering said at least one end portion;

at least one electrode positioned within the tube and electrically

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coupled to a power source, the at least one electrode operable to excite the gas and the vaporizable metal and thereby generate ultraviolet light; and

an ultraviolet-transmissive protective coating comprising a fluoropolymer, a silicon polymer, or a silicone material surrounding and in touching proximity with at least the body portion of the tube;

and

an air drive unit coupled to the fluid conduit and adapted to cause a liquid to flow through the fluid conduit and past the portion of the ultraviolet lamp in the fluid conduit, wherein the ultraviolet lamp generates an ultraviolet light which kills microorganisms in the liquid and said fluid conduit, and

wherein the ultraviolet lamp is disposed within the fluid conduit such that when in use, the protective coating is in direct contact with the liquid within the fluid conduit.

43. (New) The apparatus as recited in claim 42, wherein the protective coating surrounds and is in touching proximity with the body portion and at least a portion of the at least one end portion.

44. (New) The apparatus as recited in claim 42, wherein the protective coating is a fluoropolymer coating.

45. (New) The apparatus as recited in claim 42, wherein the body portion is formed of a fluoropolymer material.

46. (New) The apparatus as recited in claim 45, wherein said fluoropolymer coating is selected from the group consisting of PTFE, FEP, PFA, AF, and ETFE.

47. (New) The apparatus as recited in claim 42, wherein the body portion comprises a quartz or glass material.

48. (New) The apparatus as recited in claim 42, wherein the protective coating comprises a silicon polymer or silicone material.

49. (New) The apparatus as recited in claim 42, wherein the protective coating is selected from the group consisting of a shrink wrapped coating, a form pressed coating, a sprayed coating, and a dipped coating.

50. (New) The apparatus as recited in claim 42, wherein the power source is a solar power source connected to the ultraviolet lamp, and wherein the protective coating surrounds the solar power source and the ultraviolet lamp and seals the solar power source with the ultraviolet lamp.

51. (New) The apparatus as recited in claim 42, wherein the protective coating forms a seal around the tube.

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52. (New) The apparatus as recited in claim 42, wherein the at least one end cap comprises a fluoropolymer end cap.

53. (New) The apparatus as recited in claim 42, wherein the at least one end cap comprises a silicone end cap.

54. (New) The apparatus as recited in claim 42, wherein a silicone sealer seals the at least one end cap to the protective coating.

55. (New) A method of pumping and sterilizing or disinfecting a liquid held in a reservoir, comprising the steps of:

positioning a fluid conduit at least partially submerged in the liquid held in the reservoir;

placing an ultraviolet lamp at least partially within the fluid conduit, the ultraviolet lamp comprising:

a tube holding and in direct contact with a gas and a vaporizable metal, the tube comprising a body portion, at least one end portion, and optionally at least one end cap covering said at least one end portion;

at least one electrode positioned within the tube and electrically coupled to a power source, the at least one electrode operable to excite the gas and the vaporizable metal, thereby generating ultraviolet light; and

an ultraviolet-transmissive protective coating comprising a

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fluoropolymer, a silicon polymer, or a silicone material surrounding and in touching proximity with at least the body portion of the tube;

pumping air into the fluid conduit to pump liquid through the fluid conduit and past at least a portion of the ultraviolet lamp; such that the liquid within the fluid conduit is in direct contact with the protective coating; and

illuminating the ultraviolet lamp by exciting the gas and vaporizable metal within the tube so that the ultraviolet light is generated, killing microorganisms in the liquid and the fluid conduit.

56. (New) The method as recited in claim 55, wherein the protective coating is a fluoropolymer coating.

57. (New) The method as recited in claim 56, wherein said fluoropolymer coating is selected from the group consisting of PTFE, FEP, PFA, AF, and ETFE.

58. (New) The method as recited in claim 55, wherein the body portion is formed of a fluoropolymer material.

59. (New) The method as recited in claim 55, wherein the body portion comprises a quartz or glass material.

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60. (New) The method as recited in claim 55, wherein the protective coating comprises a silicon polymer or silicone material.

61. (New) The method as recited in claim 55, wherein the protective coating is applied to at least the body portion of the casing by a process selected from the group consisting of heat shrinking the protective coating onto at least the body portion of the tube, form pressing the protective coating onto at least the body portion of the tube, spraying the protective coating onto at least the body portion of the tube, and dipping at least the body portion of the tube into a liquid material.

62. (New) The method as recited in claim 55, wherein the power source is a solar power source connected to the ultraviolet lamp, and wherein the protective coating surrounds the solar power source and the ultraviolet lamp and seals the solar power source with the ultraviolet lamp.

63. (New) The method as recited in claim 55, wherein the protective coating forms a seal around the tube.

64. (New) The method as recited in claim 55, wherein the at least one end cap comprises a fluoropolymer end cap.

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65. (New) The method as recited in claim 55, wherein the at least one end cap comprises a silicone end cap.

66. (New) The method as recited in claim 55, wherein the at least one end cap is sealed to the protective coating using a silicone sealer.

Reasons for Allowance

2. The following is an examiner's statement of reasons for allowance:

While the prior art is replete with instances of immersing an ultraviolet lamp encased within a sheath, there is no teaching or suggestion in the prior art of immersing the tube of a conventional ultraviolet lamp having an electrode without first encasing it in a sheath. See, for example, Kitamura et al (JP 7-39273), which teaches placing conventional UV lamp 3 within protective quartz jacket 4. Maarschalkerweerd (U.S. 5,006,244) discloses a fluid purification device wherein the UV lamps 14 are enclosed within protective quartz sleeves 15. Moreover, although the prior art discloses coating the protective sheath of a lamp having an electrode with a fluoropolymer (see Peterson, US 4,968,489) *or* coating a lamp having an electrode and subsequently covering the coated lamp with a protective sheath (see Titus et al., US 5,322,569), none teach or suggest a protective coating on a lamp having an electrode surrounding and in touching proximity therewith such that the coated lamp *itself* can be placed in direct contact with liquid without need of an additional quartz or glass sheath. In fact, the Peterson and Titus et al. references above both require a quartz sleeve external to the lamp for immersion in liquid. The prior art taught that a sleeve in addition to any protective coating was necessary to prevent the

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bulb from breaking, to prevent contact between the electrode and electrical components and the liquid in the event of breakage, and to prevent cooling of the bulb. The instant specification discloses that the protective sleeve is sufficient to protect and thermally insulate the bulb.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

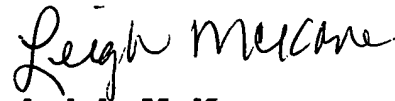
3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leigh McKane whose telephone number is 571-272-1275. The examiner can normally be reached on Monday-Thursday (5:30 am-2:00 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on 571-272-1226. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

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applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Leigh McKane
Primary Examiner
Art Unit 1744

elm
23 January 2006